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UNION CARBIDE CORPORATION
NUCLEAR DIVISION
P. O. BOX Y, OAK RIDGE, TENNESSEE 37831

April 10, 1972

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U. S. Atomic Energy Commission
Post Office Box E
Oak Ridge, Tennessee 37830

Attention: Mr. C. A. Keller

Gentlemen:

Accidental SS Material Loss

On March 27, 1972, a loss estimated to be equivalent to 600 grams of weapons grade uranium (valued at approximately $6,050) was vented to the atmosphere from the Building 9212 casting area exhaust ventilation system. This amount was determined from the air particulate sample that is collected each operating day from the exhaust ventilation. No appreciable amount of radiation was detected by either the permanent outside air sampling stations or by a special survey of the surrounding area the next morning.

Bag filters are used for final filtration of the nominal 60,000 cfm of air exhausted from the hoods and furnace enclosures, and from other equipment located in the Building 9212 E-Wing Casting Area. This dust collector is located outside the building near the east side of the casting area. Air exhausted from the bag filter is discharged to the atmosphere through a 30-foot-high stack at the bag filter house. There are a total of 20 bags in the dust collector and each one is 18-inch diameter by 20 feet long. Every three to four months new bags are installed and the used bags salvaged.

The exhaust system design is based on a negative pressure range of minus 1-1/2 inches to minus 1/4 inch. When the solids buildup on the bags causes the negative pressure to approach the 1/4 inch negative pressure limit, it is necessary to blow back the filter bags and thus reduce the pressure drop through the filters. Usually about 10 to 15 minutes are required to reestablish the 1-1/2 inch negative pressure in the exhaust duct. During a normal blowback operation, a stack loss occurs that is equivalent to about 10 grams of enriched uranium. On an average, approximately 10 blowbacks a month are required.

After the blowback operation, the hold up on the bag filters is approximately 60 kilograms of solids containing about 15 to 18 kilograms of enriched uranium. Typically, five kilograms of solids containing about one kilogram of enriched uranium collects in the safe geometry traps located on the bottom of the filter house during the operation.

The pressure in the exhaust duct reached the 1/4 inch negative pressure limit on March 27, 1972, and it became necessary to blow back the filters. The blower which supplies the air for blowback was started at approximately 8:00 a.m. While the blower was running, a power failure occurred at 8:05 a.m. in the 440 volt power distribution system. In 30 minutes, power was restored and the fan self-started because it was equipped with a maintain contact type starting switch. At 1:30 p.m., the process foreman discovered that the blowback system was operating. Allowing for the power outage, the blowback system ran for approximately five hours. During this time, the accidental enriched uranium loss occurred.

The air from the filter house is monitored continuously with an alpha radiation monitor which has recording and high level alarm features. One of the alarms is located in the E-Wing operating area and the other alarm is located in the Building 9706-2 Plant Shift Superintendents' office. The monitor should have detected and signaled the abnormal condition that caused the loss. Both alarms failed to function during the blowback incident even though the regular weekly maintenance checkout had been performed on March 24, 1972.

To prevent a reoccurrence of the event, we are doing the following:

1. Conducting a daily checkout of the alpha radiation monitor.
2. Upgrading the alpha radiation monitoring instrumentation.
3. Installing an automatic timer with a maximum 15 minute set point in the blowback system power circuit.
4. Installing a magnetic type start-stop switch for operating the blowback system.
5. Installing a flashing amber light in the operating area to signal that the blowback system is being operated.
6. Performing an engineering study to evaluate the need for a back-up filter unit for the bag filter house.

Please advise if additional information is needed.

Very truly yours,

H. J. Smith

for J. M. Case, Superintendent
Oak Ridge Y-12 Plant

RAW:cc

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